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# **Annual Meeting of the Association for Tropical Biology and Conservation**

**Tropical Ecology and Society  
Reconciling Conservation and  
Sustainable Use of Biodiversity**

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**PROGRAM  
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ABSTRACTS**

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**O33-04 – S33** Free session: *The conservation of plant-animal interactions in a changing world*  
 Wednesday 22 June / 08:30-09:30 – Einstein

## **Dispersal anachronisms in Madagascan legumes: the importance of the extinct megafauna**

**WOLFGANG STUPPY, AURÉLIE ALBERT-DAVIAUD**

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**Background:** The extinction of Madagascar's megafauna between c. 2000 and 400 years ago had and continues to have consequences for biodiversity and a number of ecosystem processes, such as the dispersal of large-seeded plant species. Today, some species produce fruits and seeds obviously too big to be dispersed by living frugivores. These anachronistic species are missing their extinct mutualistic partners, such as giant lemurs and elephant birds. Here, we focus on dispersal anachronisms in endozoochorously dispersed members of the legume family (Fabaceae). In Madagascar, the Fabaceae are the third most species-rich flowering plant family, comprising 667 species of which 459 are endemic.

**Method:** We performed literature reviews to gather data about the plants (life form, fruit type, fruit and seed size, dispersal mode, number of seeds per fruit, habitat, distribution) as well their actual and potential animal dispersers (body size, diet, habitat, distribution), the latter including both living and extinct frugivores. We also added first-hand observations on herbarium specimens at the Royal Botanic Garden, Kew.

**Result:** The extant frugivorous guild in Madagascar is strikingly small compared to other tropical areas. Only 21 lemur, three bat, five bird and one tortoise species are mainly frugivorous (excl. granivores), and, among those, only some lemurs are able to disperse (i.e. swallow) very large (> 10 mm) seeds. Out of 505 native and endemic Fabaceae species in Madagascar, we were able to estimate the degree of dispersal anachronism of 481 species (95%). For the remaining species, sufficient information about fruits and seeds was unavailable. We found at least 17 species of Fabaceae in which the mismatch between fruit and seed morphology, and the physical limitations and sensory preferences of living fauna strongly indicates dispersal anachronism.

**Conclusion:** In Madagascar, many species from a wide range of plant families possess large pulpy fruits with big seeds. Therefore, it is a mere certainty that dysfunctional dispersal due to anachronism reaches far beyond the Fabaceae and, in fact, is a common problem affecting Madagascar's unique flora. It has been demonstrated that the loss of animal seed dispersers considerably increases the risk of extinction for plants with zoochorous fruits or seeds. Hence, apart from habitat destruction, dysfunctional seed dispersal is likely to be one of the main reasons why most of these species are now on the edge of extinction

**O34-01 – S34** Free session: *Tropical forest ecology, conservation and management*  
 Wednesday 22 June / 10:00-15:30 – Einstein

## **Conservation of tropical humid forest and wood supply in French Guiana: how sustainable forest plantation could help to respond to local demand in the future?**

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In French Guiana, the forest sector (including private and public actors) will face strategic choices to respond to the increasing demand in wood supply for the coming decades. Indeed population in French Guiana is currently growing at a rate of around 2.5% per year and should exceed 500 000 inhabitants by 2050 leading to an increased consumption of material, energy and space. Tropical humid forests that cover 90% of the territory will be at the center of production and conservation concerns. Strategic choices, based on strong political decisions, include the volume of wood to be produced locally, the type of production (timber vs fuelwood) and the origin (plantation vs natural forest).

We conducted a work to analyze the opportunities of the forestry sector to meet these challenges. All wood supply is currently provided through the management of natural forests. An alternative issue would be to produce wood from forest plantation. Experimental tree plantations have been developed since the 70's in French Guiana. More than 30 local species and 26 exotic species have been tested to evaluate their potential in tree plantation. Up to now no plantation were established at larger scale in French Guiana.

We identified various scenarios to reach the wood supply by 2050. The scenarios were elaborated in two phases. First, we interviewed key actors of the forestry sector who gave their view on that perspective. It appeared that tree plantation is considered as a real opportunity for most of the actors. Second, species performance in tree plantation trials was carefully analyzed through mortality rates and tree productivity. Six species (four locals and two exotics) were identified with a high potential for sustainable forest plantation. Sustainability of natural forest management was also assessed based on the results provided by the Paracou experimental plot.

Four main scenarios were identified. Wood production is calculated for both managed forests and forest plantation and duration of each production cycle is provided. For each scenario, surface dedicated for natural forest management and tree plantation is estimated. Results are discussed in the light of the sparing and sharing strategies.

The four scenarios are providing a framework of discussions that could help the actors to focus on the long term and to imagine the likely impacts of current policy choices on conservation of natural forests.